

PGE DG Interconnection Requirements and Projects

Overview

A. Interconnection Requirements, Procedures and Agreement

1. “PGE Interconnection Requirements for Distributed Generation” in Compliance with:
 - i. IEEE Standard P1547 – “Standard for Interconnecting Distributed Resources with Electric Power Systems”. (Draft 10 – 9/26/02)
 - P1547.1 - “Draft Standard for Conformance Test Procedure for Equipment Interconnecting Distributed Resources with Electric Power Systems”.
 - P1547.2 - “Draft Application Guide for IEEE Standard 1547 for Interconnecting distributed Resources with Electric Power Systems”.
 - P1547.3 - “Draft Guide for Monitoring, Information Exchange and Control of Distributed Resources Interconnected with electric Power systems”.
 - ii. Applicable Codes and Standards
 - National Electrical Code
 - National Electrical Safety Code
 - Oregon State Electric Code
 - PGE Electric Service Standard
 - Oregon House Bill 3219 – Regulation for Net Metering Program
2. “Interconnection Requirements for Parallel Generators – 25-kW or Less Including Net Metering Projects”.
3. Standard Procedures and Agreement
 - i. NARUC (The National Association of Regulatory Utility Commissioners) – “Model Distributed Generation Interconnection Procedures and Agreement”
 - ii. FERC - “Standard Generator Interconnection and Operating Agreement”
FERC - “Standard Generator Interconnection Procedures”

B. DG Projects Overview

1. PGE Dispatchable Standby Generation Program
 - i. MacLaren Youth Correctional Facility - 500-KW.
 - ii. TEK Systems - 1250-KW
 - iii. AFRC - 1600-KW
 - iv. U.S. Bank - 7-MW
 - v. Credence - 4-MW (Pending)
 - vi. TYCOM - 6.6-MW (Ongoing Negotiation)
 - vii. PSU - 3-MW (Ongoing Negotiation)
2. Bio-gas Projects
 - i. Calgon Dairy - 100-KW Induction
 - ii. Boardman - 2 1200-KW (Ongoing Negotiation)
3. Micro-Turbine Projects
 - i. NW Natural Pilot - 3 30-KW (Capstone)
4. Fuel Cell Projects
 - i. National Earth Advantage Center - 3-KW
5. Photovoltaic Projects
 - i. Brewery Block - 20-kW
 - ii. 17 Small projects in service (1 - 4-KW)
6. Small Hydro Projects - 11 Projects in service (40 – 500-KW)

C. PGE Internet Site - DG Information (November)

<http://www.portlandgeneral.com/>

IEEE Standard P1547 Summary

1. Applicable to:

- DG up to 10 MVA in size (aggregate) at the PCC (Point of Common Coupling)
- Automatic Transfer Scheme (Close Transition) – Longer than 100 ms

2. Interconnection Technical Specifications and Requirements

- **Voltage Regulation** - DG shall not actively regulate at the PCC.
- **Integration with Utility Grounding**
- **Synchronization** - DG shall not cause more than $\pm 5\%$ voltage fluctuation
- **Inadvertent Energization of the Utility system** - DG shall not energize the de-energized Utility system
- **Monitoring Provisions** - Larger than 250-KVA
- **Isolation Device** - A readily accessible, lockable, visible-break device
- **Faults Detection** - DG shall cease to energize Utility system for faults
- **Utility Reclosing coordination** - DG shall cease to energize the Utility system prior to reclosure by the Utility system
- **Abnormal Voltages** - Over and Undervoltage trip settings
- **Abnormal Frequencies** - Over and Underfrequency trip settings
- **Reconnection to the Utility system** - 5 minutes delay
- **Power Quality Requirements** - (IEEE STD 519)
- **Unintentional Islanding** - DG shall cease to energize the Utility system within 2 seconds of the formation of an island.
- **Interconnect Integrity** - EMI, Surge Withstand, paralleling device voltage withstand (220%)
- **Distribution Secondary Spot Network** - Interconnection Requirements

3. Interconnection Test Specifications and Requirements

- **Design Test** - Response to Abnormal Voltage and Frequency, Synchronization, and Interconnect Integrity Test
- **Unintentional Islanding**
- **Limitation of DC Injection and Harmonics**
- **Production Test** - (Factory or Commissioning Test)
- **Interconnection Installation Evaluation** - Grounding, Isolation device, Monitoring Provisions, Fault Detection, Utility Reclosing Coordination
- **Commissioning Test** - Functionality Test
- **Periodic Interconnection Tests**